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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,707	04/13/2006	Joseph Shapira	31254	2224
7590 Martin D Moynihan Prtsi Inc P O Box 16446 Arlington, VA 22215			EXAMINER KASRAIAN, ALLAHYAR	
			ART UNIT 2617	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/575,707

Applicant(s)

SHAPIRA, JOSEPH

Examiner

ALLAHYAR KASRAIAN

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/CD/CD)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Claim Objections

2. **Claim 34** is objected to because of the following informalities:

a) On **line 5 of claim 34**, delete "at least one" after "said";

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 13 and 17** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. **Claim 13** indicates the communication link between the switching matrix and a base station is a directional communication link. **Claim 17** indicates the repeater is connected to the switching matrix by a directional link. However, the specification does not describe what directional communication link (see page 11, lines 29-31 of the

Art Unit: 2617

specification regarding type of communication links). For purpose of applying prior art, Examiner considers the directional communication link and the direction link as radio links of directional antennas.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1, 10 and 21** are rejected under 35 U.S.C. 102(b) as being anticipated by **Bassirat (US Patent # 6122513)**.

Consider **claim 1**, Bassirat discloses a load balancing system for dynamic balancing of load between sectors of local sectorized cellular base stations, the system comprising:

a plurality of repeaters for providing local coverage within the sectors (FIGS. 4-6 col. 5 lines 32-67 for repeaters 42-43, 53-56 or 63-64 and sectors corresponding to sectors alpha or beta of each cell), and

a switch, for associating between the repeaters and a respective one of said local sectorized base stations, and for switching the repeaters between different sectors (FIGS. 4-6, col. 5 lines 32-67, the base station (e.g. 44 of FIG. 4) is considered as the switch because the repeaters are switched between different sectors of two or more boundaries of different cells; the repeaters communicate on two different frequencies).

Consider **claim 10 as applied to claim 1 above**, Bassirat discloses an omni-antenna applied to a respective base station for communicating with said repeaters (col. 5 lines 61-64).

Consider **claim 21 as applied to claim 1 above**, Bassirat discloses at least one of said repeaters is assignable between sectors of at least two different base stations (FIGS. 4-6, col. 5 lines 32-47).

7. **Claim 34** is rejected under 35 U.S.C. 102(e) as being anticipated by **Yarkosky (US Patent # 7406295 B1)**.

Consider **claim 34**, Yarkosky discloses a method of load balancing at a sector-based cellular base station whose traffic has temporary hot spot characteristics, the method comprising:

Art Unit: 2617

assigning a repeater to at least one of said hotspots (col. 49-51, col. 9 lines 37-40, hotspots are considered where the range of signal from a base station is weakened or where the drop calls are high),

associating said repeater with a switching matrix (FIGS. 2 and 3, col. 20-30 for MSM 206 as switching matrix; col. 8 lines 1-8),

connecting said switching matrix to allow switching of said at least one repeater between sectors of said sector-based cellular base station (FIGS. 3 and 5, col. 7 lines 42-59; col. 9 lines 41-67 to col. 10 lines 1-2.),

measuring usage load at respective ones of said sectors (col. 2 lines 14-26; col. 7 lines 23-29; col. 7 lines 57-67; col. 10 lines 3-8), and

controlling said switching matrix to switch said at least one repeater between said sectors in order to achieve balancing of said usage load between said sectors (col. 9 lines 4-40; col. 10 lines 3-21).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 2617

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 2-9, 11-20 and 22-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bassirat (US Patent # 6122513)** in view of **Gordon et al. (US Patent # 6937863 B1)** (hereinafter Gordon).

Consider **claim 2 as applied to claim 1 above**, Bassirat discloses the claimed invention except said switch comprises a switching matrix for permitting connections between ones of said plurality of repeaters and each sector of a respective base station.

In the same field of endeavor, Gordon discloses said switch comprises a switching matrix for permitting connections between ones of said plurality of repeaters and each sector of a respective base station (FIG. 5, col. 8 lines 25-53).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate switching matrix as taught by Gordon to switching base station disclosed by Bassirat for purpose of rating sectors based on their loading capacity.

Consider **claim 3 as applied to claim 2 above**, Gordon further discloses said switching matrix comprises a control mechanism for controlling said

Art Unit: 2617

switching matrix to switch ones of said repeaters from a currently heavily loaded sector to a currently lightly loaded sector (FIG. 5 col. 8 lines 41-53).

Consider **claim 4 as applied to claim 2 above**, Gordon further discloses said switching matrix has a base station side and a repeater side and wherein said base station side is connected to RF outputs of a respective sectorized base station (FIG. 5, col. 8 lines 25-53).

Consider **claim 5**, Bassirat as modified by Gordon disclose the claimed invention **as applied to claim 4 above**, and in addition Bassirat discloses said repeater side has a plurality of connections, each for a different repeater and wherein each output is associated with a frequency converter (col. 5 lines 32-67).

Consider **claim 6**, Bassirat as modified by Gordon disclose the claimed invention **as applied to claim 5 above**, and in addition Bassirat discloses said frequency converters are configured for converting between an assigned base station RF frequency (F1) and another frequency (F2) within the same cellular band as an assigned base station RF frequency, thereby allowing legacy antennas of said base station to be used for communicating with said repeaters (col. 5 lines 32-67).

Consider **claim 7**, Bassirat as modified by Gordon disclose the claimed invention **as applied to claim 6 above**, and in addition Bassirat discloses

Art Unit: 2617

assigned base station RF frequency and said another frequency are both multi-carrier frequencies (col. 3 lines 14-24 note for multiple cells).

Consider **claim 8**, Bassirat as modified by Gordon disclose the claimed invention **as applied to claim 6 above**, and in addition Bassirat discloses respective repeaters are tuned to different frequencies (col. 5 lines 32-67).

Consider **claim 9**, Bassirat as modified by Gordon disclose the claimed invention **as applied to claim 6 above**, and in addition Bassirat discloses the another frequency is in a different frequency band from a base station assigned frequency and wherein additional antennas are applied to said base station for communicating with said repeaters (col. 6 lines 2-11).

Consider **claim 11 as applied to claim 2 above**, Gordon further discloses said switching matrix is remotely located from a respective cellular base station and is connected thereto via a communication link (FIG. 2, col. 4 lines 15-29, and col. 8 lines 25-53 for controller 23).

Consider **claims 12-15 as applied to claim 11 above**, Bassirat as modified by Gordon disclose the claimed invention except said communication link is a radio link, an optical link, or a micro wave link.

Nonetheless, the Examiner takes Official Notice that it is notoriously well known in the art to send and receive signals or data between two or more

Art Unit: 2617

communication nodes, a variety of communication links such as radio, microwave or optical link could be used.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to transmit or receive signals or data over a radio, microwave or an optical link for purpose of connection two or more communication nodes.

Consider **claims 16-19 as applied to claim 2 above**, Bassirat as modified by Gordon disclose the claimed invention except said repeater is connected to said switching matrix by a(n) directional, optical or microwave.

Nonetheless, the Examiner takes Official Notice that it is notoriously well known in the art to send and receive signals or data between two or more communication nodes, a variety of communication links such as radio, microwave or optical link could be used.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to transmit or receive signals or data over a radio, microwave or an optical link for purpose of connection two or more communication nodes.

Consider **claim 20**, Bassirat as modified by Gordon disclose the claimed invention **as applied to claim 2 above**, and in addition Bassirat discloses at least one of said repeaters has connections to a plurality of switching matrices,

Art Unit: 2617

thereby allowing it to be associated with sectors from different base stations (FIGS. 4-6, col. 5 lines 32-67).

Consider **claim 22 as applied to claim 3 above**, Gordon further discloses said control mechanism is responsive to a per-sector load sensing mechanism (abstract, col. 1 lines 65-67 to col. 2 lines 1-12; col. 5 lines 64-67).

Consider **claim 23 as applied to claim 22 above**, Gordon further discloses said control mechanism comprises an optimization algorithm that takes an output of said per-sector load sensing mechanism and efficiently reassigns said repeaters between said sectors to balance said load (col. 7 lines 41-54).

Consider **claim 24 as applied to claim 22 above**, Gordon further discloses said per-sector load sensing mechanism is sensitive to total transmitted power per sector (col. 6 lines 1-34).

Consider **claim 25 as applied to claim 22 above**, Gordon further discloses said per-sector load sensing mechanism is sensitive to a current number of users per sector (col. 2 lines 13-26).

Consider **claim 26 as applied to claim 22 above**, Gordon further discloses said per sector load sensing mechanism is sensitive to uplink received power (col. 10 lines 17-32).

Consider **claim 27 as applied to claim 22 above**, Gordon further discloses said per-sector load sensing mechanism is sensitive to total transmitted power per sector and a current number of users per sector (col. 6 lines 52-67 to col. 71-17).

Consider **claim 28 as applied to claim 22 above**, Gordon further discloses a per repeater load sensing mechanism associated with said per sector load sensing mechanism (col. 1 lines 65-67 to col. 2 lines 1-12; col. 5 lines 64-67).

Consider **claim 29 as applied to claim 22 above**, Gordon further discloses a load differentiator for differentiating between a direct load of the sector and a contribution to the load from said repeaters (col. 9 lines 40-58).

Consider **claim 30 as applied to claim 29 above**, Gordon further discloses said differentiator is configured to mark the repeater signal and to monitor the mark (col. 5 lines 11-18).

Consider **claim 31 as applied to claim 29 above**, Gordon further discloses said differentiator is configured to measure an uplink repeater signal at said switching matrix (col. 5 lines 11-18, col. 10 lines 17-32).

Art Unit: 2617

10. **Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bassirat (US Patent # 6122513)** in view of **Baker (WO 9927747)**.

Consider **claim 32 as applied to claim 1 above**, Bassirat disclose the claimed invention except at least one of said base stations comprises an additional sector dedicated for repeater traffic.

In the same field of endeavor, Baker discloses at least one of said base stations comprises an additional sector dedicated for repeater traffic (abstract, page 6 lines 16-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate assigned to a corresponding repeater as taught by Baker to the base stations disclosed by Bassirat for purpose of extending a coverage area of the specific sector(s).

11. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bassirat (US Patent # 6122513)** in view of **Graham et al. (US Patent Application Pub. # 20040214583)** (hereinafter Graham).

Consider **claim 33**, Bassirat discloses a load balancing system for dynamic balancing of load between sectors of local sectorized cellular base stations, the system comprising:

a plurality of repeaters for providing localized coverage within the sectors (FIGS. 4-6 col. 5 lines 32-67 for repeaters 42-43, 53-56 or 63-64 and sectors corresponding to sectors alpha or beta of each cell),

an additional sector at a respective base station for handling repeater traffic (FIGS. 4-5 for sectors alpha and beta, col. 5 lines 32-67, col. 6 lines 32-52), and

a switch, for associating between the repeaters and said additional sector (col. 5 lines 32-67, the base station (e.g. 44 of FIG. 4) is considered as the switch because the repeaters are switched between different sectors of two or more boundaries of different cells).

However, Bassirat fails to explicitly disclose an additional sector at a respective base station for handling (repeater) traffic.

In the same field of endeavor, Graham discloses an additional sector at a respective base station for handling traffic (par. 0007).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an additional sector as taught by Graham to base stations in communication with repeaters disclosed by Bassirat for purpose of increase capacity in a coverage area of cell.

12. **Claims 35-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gordon et al. (US Patent # 6937863 B1)** (hereinafter Gordon) in view of **Bassirat (US Patent # 6122513)**.

Consider **claim 35**, Gordon discloses a method of upgrading an existing sector-based cellular base station using repeaters, said upgrade to enable dynamic load balancing, the upgrade comprising:

attaching a switching matrix to respective sector RF connections of said base station (FIG. 5, col. 8 lines 25-53),

obtaining an output from said base station indicating sector usage loading (col. 2 lines 1-9), and

connecting said obtained output to control said switching matrix to switch said repeaters between said sector RF connections, thereby to enable balancing of repeater-based load between said sectors (col. 8 lines 25-53; FIG. 7 col. 32-58).

However, Gordon fails to disclose assigning respective connections of said switching matrix to said repeaters.

In the same field of endeavor, Bassirat discloses assigning respective connections of said switching matrix to said repeaters (FIGS. 4-6, col. 5 lines 67, col. 6 lines 42-52).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the repeaters located in the sectors of a base station as taught by Bassirat to the dynamically adjusting sectorization method using switching matrix as disclosed by Gordon to change the angle coverage of sectors to cover a new set of repeaters or to disengage the repeaters under pervious coverage for purpose of balancing loads between sectors of a base station.

Consider **claim 36**, Gordon discloses a method of load balancing between sectors of a cellular base station, the sectors having repeaters, the method comprising:

measuring load at respective sectors of the cellular base station (col. 1 lines 65-67 to col. 2 lines 1-12),

determining whether there are sectors that are overloaded and underloaded (col. 7 lines 41-54),

However, Gordon fails to disclose for each overloaded sector, switching at least one repeater therefrom to another sector.

In the same field of endeavor, Bassirat discloses for each overloaded sector, switching at least one repeater therefrom to another sector (FIGS. 4-6, col. 5 lines 32-60, and col. 6 lines 32-52).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate switching between repeaters and sectors as taught by Bassirat to the sectors disclosed by Gordon for purpose of dynamically change the traffic conditions on the sectors base stations.

Consider **claim 37 as applied to claim 36 above**, Bassirat further discloses said at least one repeater is a repeater from another sector currently connected via a respective overloaded sector (col. 5 lines 33-47 and col. 6 lines 38-52).

Consider **claim 38 as applied to claim 36 above**, Bassirat further discloses said at least one repeater is a repeater from said currently overloaded sector (col. 5 lines 8-20, col. 6 lines 38-52).

Consider **claim 39 as applied to claim 36 above**, Bassirat further discloses said switching comprises switching a single repeater and said measuring, determining and switching are repeated iteratively until no sector is overloaded (col. 6 lines 23-52).

Consider **claim 40 as applied to claim 36 above**, Bassirat further discloses said switching comprises switching a single repeater and said measuring, determining and switching are repeated iteratively until it is apparent that a state in which no sector is overloaded is currently unattainable (col. 5 lines 33-47 and col. 6 lines 38-52).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

- a. Yarkosky (U.S. Patent # 7406295 B1) discloses Method for dynamically directing a wireless repeater

Art Unit: 2617

- b. Gilmore et al. (U.S. Patent # 5861844) disclose Method and apparatus for providing redundant coverage within a cellular communication system.
 - c. Uesugi (U.S. Patent # 6804491 B1) discloses Mobile communication system and repeater used in the mobile communication system.
 - d. Bassirat (U.S. Patent # 6507741 B1) discloses RF Repeater with delay to improve hard handoff performance
 - e. Rath (U.S. Patent Application Publication # 20050068902) discloses Scalable broadband wireless mesh access network.
14. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

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Hand-delivered responses should be brought to

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401 Dulany Street
Alexandria, VA 22314

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Allahyar Kasraian whose telephone number

Art Unit: 2617

is (571) 270-1772. The Examiner can normally be reached on Monday-Thursday from 8:00 a.m. to 5:00 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Pérez-Gutiérrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

*/Allahyar Kasraian/
Examiner, Art Unit 2617*

A.K./ak

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Supervisory Patent Examiner, Art Unit 2617*

January 4, 2009